“MODIFICATION OF THE DESIGN OF SMART”“AGRICULTURE EGG PLANT MACHINE”

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ABSTRACT

Monitoring and control of egg plant machine (egg hatching machine) environment play an important role in eggplant machine (egg hatching machine) production and management. To monitor the eggplant machine (egg hatching machine) environment parameters effectively, it is necessary to design a measurement and control system. The objective of this project is to design a simple, easy to install, microcontroller-based circuit to monitor and record the values of temperature, humidity of the natural environment that are continuously modified and controlled in order optimize them to achieve maximum egg produce chicks. The controller used is a low power, cost efficient chip manufactured by Atmel having 8k bytes of on-chip flash memory. It communicates with the various sensor modules in real-time in order to control the temperature was gotten to be 37°C, average percent humidity value of 56.15% process efficiently inside an eggplant machine (egg hatching machine) by actuating a fogger, respectively according to the necessary condition of the egg . An integrated liquid crystal display (LCD) is also used for real time display of data acquired from the various sensors and the status of the various devices. Also, the use of easily available components reduces the manufacturing and maintenance costs. The design is quite flexible as the software can be changed any time. It can thus be tailor-made to the specific requirements of the user. This makes the proposed system to be an economical, portable and a low maintenance solution for eggplant machine (egg hatching machine) applications, especially in rural areas and for small scale agriculturists.

Keywords:

- Frame/Chamber: iron metallic box and Glass
- Heating System: Bulb and Plastic Can
- Ventilation: Fan
- Control System: Micro-Controller , Arduino nano, Sensor
- Turning System: 2 way DC Motor, Pulley, Carpet

INTRODUCTION

There is continuous increase in demand for food production technology. India is a country where the economy is dependent on agricultural produce. Agricultural means can satisfy the food production demand. But due to isotropic climatic conditions agricultural produce does not meet the demands.

The most important difference between natural and artificial incubation is the fact that the natural parent provides warmth by contact rather than surrounding the egg with warm air. The concern with a lot of consumer needs and demand for the agriculture products has stimulated awareness among the farmer that increases their products in the market by implementing advance technologies in this industry

In the previous decade an eggplant machine (egg hatching machine) concept was implemented by which real time controlling against the field environment like temperature humidity etcetera were done automatically. The control action had done in a way that the sensor from sensing station or sensing system generates the output related to the estimated parameter but it seems lack of general purpose automation system.

The proposed system is an embedded system which will monitor and control the microclimatic parameters of an eggplant machine (egg hatching machine) on a regular basis round the clock for cultivation of egg or specific egg species which could maximize their production over the whole crop growth season and to eliminate the difficulties involved in the system by reducing human intervention to the best possible extent using sensors, Analog to Digital Converter, microcontroller and relays. When any of the above mentioned climatic parameters cross a safety threshold which has to be maintained to protect the egg, the sensors sense the change and the microcontroller reads this from the data at its input ports after being converted to a digital form by the ADC. The microcontroller then performs the needed actions by employing relays until the strayed-out parameter has been brought back to its optimum level. Since a microcontroller is used as the heart of the system, it makes the set-up low-cost and effective nevertheless. As the system also employs a GLCD display for continuously alerting the user about the condition inside the eggplant machine (EGG HATCHING MACHINE), the entire set-up becomes user friendly

Statement of Problem

- Improper control of humidity in the EGG PLANT MACHINE
- Improper control of Turning of eggs
- Improper the egg prod

LITERATURE SURVEY

1. DEVELOPMENT AND TEMPERATURE CONTROL OF SMART EGG INCUBATOR SYSTEM FOR VARIOUS TYPES OF EGG

Okpagu, P. E. & Nwosu, A. W.

This work is aimed at modeling, designing and developing an egg incubator system that is able to incubate various types of egg within the temperature range of 35 – 40C. This system uses temperature and humidity sensors that can measure the condition of the incubator and automatically change to the suitable condition for the egg. Extreme variations in incubation temperature affect the embryo and ultimately, post hatch performance. In this work, electric bulbs were used to give the suitable temperature to the egg whereas water and controlling fan were used to ensure that humidity and ventilation were in good condition. LCD is used to display status condition of the incubator and an interface (Keypad) is provided to key in the appropriate temperature range for the egg. To ensure that all part of the eggs was heated by the lamp, DC motor was used to rotate iron rod at the bottom side and automatically change position of the egg. The entire element is controlled using AT89C52 Microcontroller. The temperature of the incubator is maintained at the normal temperature using PID controller implemented in microcontroller. Mathematical model of the incubator, actuator and PID controller were developed. Controller design based on the models was developed using Matlab Simulink. The models were validated through simulation and the Zeigler-Nichol tuning method was adopted as the tuning technique for varying the temperature control parameters of the PID controller in order to achieve a desirable transient response of the system when subjected to a unit step input. After several assumptions and simulations, a set of optimal parameters were obtained at the result of the third test that exhibited a commendable improvement in the overshoot, rise time, peak time and settling time thus improving the robustness and stability of the system.

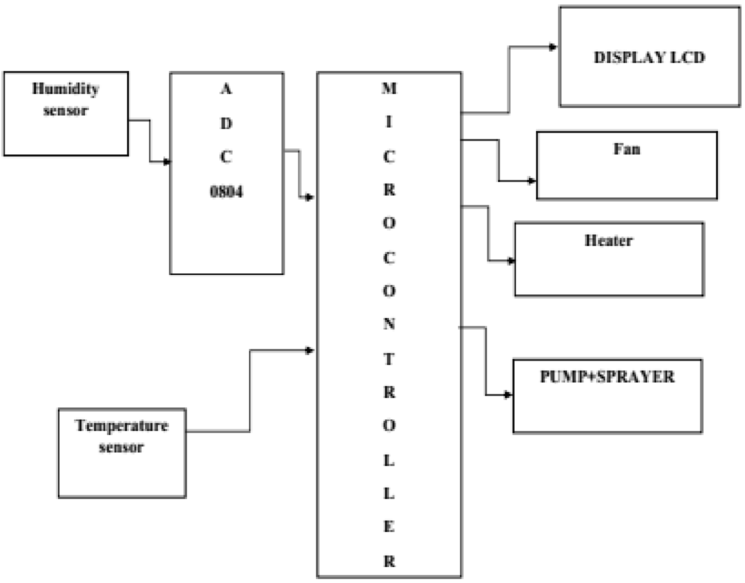
2. Design and Implementation of a Fully Automated Egg Incubator

K. Radhakrishnan, Noble Jose, Sanjay S G, Thomas Cherian, Vishnu K R

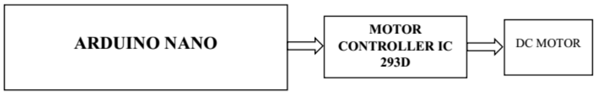
The purpose of this paper is to explain the design of a microcontroller based egg incubator system which is able to automatically maintain the environment which is optimum for embryo growth. The system has a temperature sensor which is able to monitor the temperature inside and outside the incubator and this data is sent to a microcontroller. The microcontroller, with the help of relays controls an incandescent lamp and an air circulating fan to maintain the egg temperature from 37 to 38.5°C. In addition, an LCD display is used to display the temperature inside and outside the incubator. The microcontroller also has a user-programmed timer to control a gear motor for tilting the egg-holder.

BLOCK DIAGRAM

TEMPERATURE CONTROLLER AND HUMIDITY CONTROLLER BLOCK DIAGRAM



ARDUINO NANO EGGS TURNING MACHINE



SPECIFICATION PROJECT

1. Temperature

The important of controller into temp. The egg machine control the temp. In 36.5^0c to 39^0c control in the range. Overheating is much more critical than under-heating, it will speed up rate of development causing abnormal embryos development in the early stages, and lower the percentage of hatchability

2. Humidity

The important of controller into humidity. The egg machine control the humidity. In 60% to 70% control range. 1st day to 15th humidity is 63% and after 15th day well be 69%.

3. Turning of eggs

The important of controller into turning. The egg machine controller the turning. In 2nd day to 18th day total turning well be 2499 Clockwise rotting and 2465 Anti-clockwise rotting. The per day egg well turning in 147 - 149 clockwise and 143-145 anticlockwise rotting.

4. Ventilation

The ventilation of the egg machine is the embryo develops it uses oxygen and gives off carbon dioxide. The best egg machine results are obtained within 20-21% oxygen in the air the normal oxygen level in the atmosphere and tolerate a carbon dioxide level of 5-6% is mentions

PARTS OF THE SYSTEM:

1. Sensors (Data acquisition system)
- Temperature sensor (LM35 / DS18B20)
- Humidity sensor (SY-HS-220)
2. Analog to Digital Converter (ADC 0804)
3. Microcontroller (AT89S52)
4. Liquid Crystal Display (Hitachi's HD44780)
5. Actuators – Relays
6. Devices controlled
- Water Pump (simulated as a bulb)
- Sprayer (simulated as a bulb)
- Cooler (simulated as a fan)

7. ARDUINO NANO

1. TRANSDUCERS (Data acquisition system):

- This part of the system consists of various sensors, namely humidity, temperature. These sensors sense various parameters- temperature, humidity and are then sent to the Analog to Digital Converter.

2. ANALOG TO DIGITAL CONVERDER (ADC):

- The analog parameters measured by the sensors are then converted to corresponding digital values by the ADC.

3. MICROCONTROLLER:

- The microcontroller is the heart of the proposed embedded system. It constantly monitors the digitized parameters of the various sensors and verifies them with the predefined threshold values and checks if any corrective action is to be taken for the condition at that instant of time. In case such a situation arises, it activates the actuators to perform a controlled operation.

4. ACTUATORS:

An array of actuators can be used in the system such as relays, contactors, and change over switches etc. They are used to turn on AC devices such as motors, coolers, pumps, fogging machines, sprayers. For the purpose of demonstration relays have been used to drive AC bulbs to simulate actuators and AC devices. A complete working system can be realized by simply replacing these simulation devices by the actual devices.

5. DISPLAY UNIT:

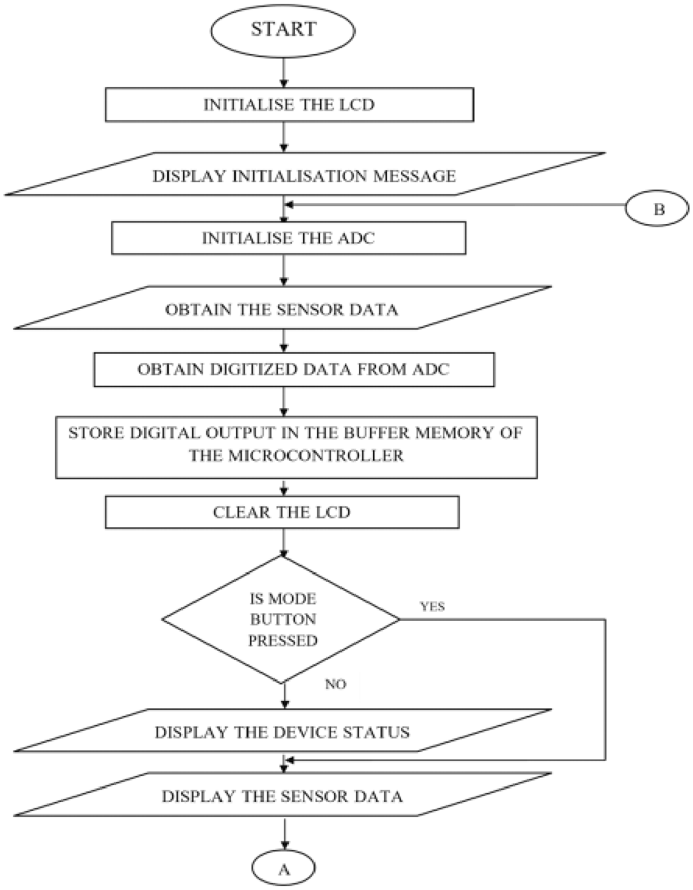
A Liquid crystal display is used to indicate the present status of parameters and the respective AC devises (simulated using bulbs). The information is displayed in two modes which can be selected using a push button switch which toggles between the modes. Any display can be interfaced to the system with respective changes in driver circuitry and code.

SOFTWARE REQUIREMENT

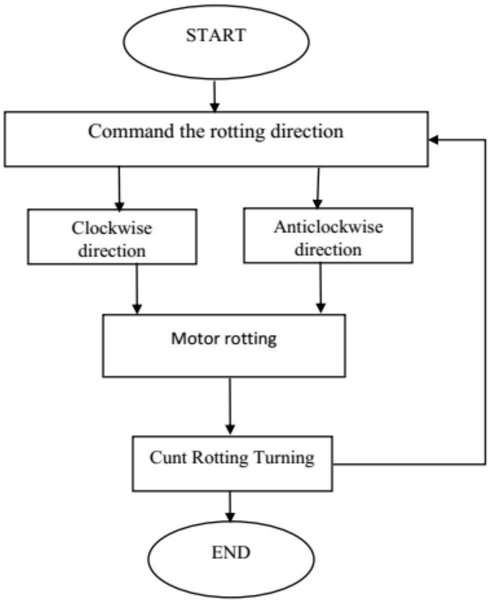
1. Proteus v8
2. Keil v5
3. Flash magic
4. arduino-1.8.5

PROJECT WORKING FLOW CHART

TEMPERATURE CONTROLLER AND HUMIDITY CONTROLLER FLOWCHART REPRESENTING THE WORKING OF THE SYSTEM


START
INITIALISE THE LCD
DISPLAY INITIALISATION MESSAGE
B
INITIALISE THE ADC
OBTAIN THE SENSOR DATA
OBTAIN DIGITIZED DATA FROM ADC
STORE DIGITAL OUTPUT IN THE BUFFER MEMORY OF THE MICROCONTROLLER
CLEAR THE LCD
IS MODE BUTTON PRESSED
YES
NO
DISPLAY THE DEVICE STATUS
DISPLAY THE SENSOR DATA
A

ARDUINO NANO EGGS TURNING MACHINE FLOWCHART



CONCLUSION

The advantage of eggplant machine over conventional Farming is that we were able to subsistent poultry farmers to increase the production of poultry products. The temperature 36.5^0c to 39^0c between controls, humidity 60% to 70% between controls, and turning well be per day 147 clockwise & 145 anticlockwise rotating then production is 80% to 90%. Eggplant machine is sample to operating easy to change parameter. Low electrical energy invested cost is low and chip.

PROJECT GUIDE

- **Prof. M. A. Khan sir (Idea for project)**
- **Prof. V. K. Jadhav miss (provide programing nonages)**
- **Prof. C. B.SAINDANE sir (Project selection, help design and testing)**

REFERENCE

1. Singh, R.A (1990). Poultry production, kalyani publisher, New Delhi, third edition.
2. Ayivor W.F &Hellins C.E (1986) poultry keeping in tropics, Oxford University press, London, second edition
3. Abu. M. B. MohdAdid (2008), Development of smart Egg Incubator System for Various types of Egg (SEIS).
4. Bachelor Thesis (Hons) Electronics.Faculty of Electronics Engineering.Universiti Malaysia Pahang.
5. Hughes B.L., Jones J.E., and Toler J.E. (1991). Effects of Exposing Broiler Breeders to Nicarbazin
6. Contaminated Feed. Poult.Sci. 70:476-482.
7. Lourens A.H, Van den brand, R. Meijerhot and B. Kemp 2005. Effect of eggshell temperature during
8. Incubation on embryo development, hatchability and post hatch development poultry sci. 84: 914-920.
9. Ensminger, M E. (1974), Poultry Science, Avian Biology Research 2 Th Edition.
10. Wilson, H.R (1991). Physiological requirement of the developing embryo: temperature and turning chp 9, page 145-156. In avian incubation S.G Tullet, butterworth-heineman, London, U.K.
11. Romanoff A.L 1960. The avian embryo: structural and functional development. Macmillan, New York.
12. French N.A. (1997). modeling incubation temperature: the effect of incubation design. Embryonic development and egg size poultry 76:124-133.
13. .Oluyemi J.A and Robert F.A (1979). Poultry production in wet climate, Macmilla press, London pg32.
14. . Chernilaer D. (1990): The practical course of machine design. Minor publishermoscow.
15. Theraja B.L. and Theraja A.K. (2001). A test book of electrical technology. Reprinted edition.Printed in India. Pg. 1952-1958